Duchy Homes

Proposed development at: Darton Lane, Darton

Sustainability Report

26th October 2022

Luke Butler

Accredited Energy Assessor (Stroma) STRO033924

Plasmor Limited

PO Box 44

Womersley Road

Knottingley

West Yorkshire

WF11 0DN

01977 673221

technical@plasmor.co.uk

Contents

Introduction

This report has been written on behalf of Duchy Homes for the Darton Lane site.
This report will be exploring all aspects of the development which can contribute to securing high standards of sustainability.
The following aspects shall be considered:

- Building fabric improvements
- Passive solar
- Material sourcing and waste
- Fabric air tightness
- Low energy lighting
- Heating systems and controls
- Renewables
- Water usage

The Darton Lane site will be built to Approved Document L, Conservation of fuel and power, Volume 1: Dwellings, which came into effect on the 15th June 2022.

The Site

A total of 46 dwellings are to be built at Darton Lane and consist of terraced, semi-detached, and detached properties.

Darton Lane, Darton is situated in the Borough of Barnsley, South Yorkshire

Figure 1: Site layout

Building Fabric Improvements

Heat loss through the fabric of the building plays a large part in a dwelling's carbon footprint. A home which is poorly insulated will see an increase in the heat lost through the walls, floors, and roofs. This will be detrimental to the environmental sustainability due to an increase in carbon emissions. There will be an increase in running costs as more fuel will be needed to keep the home at a comfortable living temperature.

Duchy homes will improve on the maximum u value required to meet the building regulations to ensure that the emissions are kept to a minimum as shown in Table 1

Table 1: U-Value comparison

Element	Maximum U Value in Part L1A 2013	Proposed U-Value Figure	% Improvement
Ground Floor	0.18	0.14	22.22%
External Wall	0.26	0.21	19.23%
Party Wall	0.20	0.00	100.00%
Plane Roofs	0.16	0.09	43.75%
Windows	1.6	1.2	25.00%
Doors	1.6	1.2	25.00%
Air Tightness	10.00	4.00	60.00%

Duchy Homes will look at installing glazing with a good solar to heat coefficient (g value) which will help manage both solar gains and losses thus reducing heating costs and carbon emissions.

All glazing will have low-emissivity coatings to reduce heat transfer through the windows. Furthermore, the glazing will be argon filled as opposed to air filled. Argon gas is denser than the atmosphere, which provides increased thermal efficiency than having air between the panes. This will reduce the need to rely on the traditional heating system with intermittent drops in temperature.

By using high quality glazing will result in an airtight property which will retain heat more effectively. Again, this will reduce the environmental impact and carbon footprint of the dwelling due to less heating demand from the boiler.

Passive Solar

Passive solar design is a concept of designing a building to reduce the need for energy. This is created by minimizing heat loss in winter and the heat gained in

summer. Passive solar design also utilises the use natural light and ventilation as much as possible, providing a more comfortable home and improves the quality of life for the occupants.

Darton Lane has been arranged so that most properties have either a front or rear orientation facing south. This will result in an increase in the solar gains obtained by each plot. Duchy homes have utilised passive solar design on this site to reduce its environmental impact through reducing the need to heat the home and producing carbon emissions.

Materials

To support the local economy and reduce the emissions associated with transportation of goods wherever possible, materials will be sourced locally. Furthermore, careful consideration will be given to ensure materials are ordered when needed to avoid double handling/damaging before use.

Wherever possible 'A' rated materials (as defined in the BRE Green Guide to Specification) will be installed. These selections will include evaluations of cost and performance as well as environmental considerations.

Manufacturers of building materials have an obligation to ensure the materials used during manufacturing are responsibly sourced. The materials used on this project will be sourced from manufacturers that hold such credentials.

By using high quality materials and providing good workmanship on site, the heat loss associated with dwellings will decrease, which will reduce the site carbon footprint as the heating demand will be reduced. Likewise, by using local tradesmen and suppliers it will help grow the local economy.

Surface water run off

A flood risk analysis should be undertaken for the site to determine if there are any measures that need to be taken by the developer. If the area is at risk of flooding, the development will reduce the ability of the site to store floodwater or obstruct the flow of water from the site. Where possible and feasible, considerations will be made on site to reduce the flood risk.

All surface water shall be discharged through a specifically designed separate system and connected into the main sewer as agreed with the water authority or into designed soak away system to the approval of the Local Authority.

All foul water shall discharge through a specifically designed separate system and connect to an adopted main drain as per the agreements with the Local Authority.

Waste

Construction waste is a key element to be considered in achieving a reduction in all waste – it is estimated that 25-30% of all waste generated is construction related.

Waste can be generated by incorrect storage of materials, general handling losses and surpluses. These wastes can be reduced by ensuring that manufactures instructions are followed regarding handling, installing, and storing materials, good site management practices are followed, such as building to the NHBC standards and highlighting opportunities to avoid creating unnecessary waste.

Low Energy Lighting

According to a study from the Energy Saving Trust, in most homes, lighting accounts for around 15% of an annual electricity bill. Traditional bulbs waste a lot of their energy by turning it into heat meaning, they are inefficient to run, and any heat produced is lost in the ceiling.

An energy saving bulb can not only reduce a household electricity bill, it can also positively impact the environment by reducing a dwellings carbon footprint which equates to a reduction in CO^2 emissions.

Approved Document L, Conservation of fuel and power, Volume 1: Dwellings outlines a minimum light source efficacy of 75lm/W to all new build properties. Duchy Homes will install lighting which surpasses this requirement and all lighting will have an efficacy of 82lm/W.

Heating Systems and Controls

The chosen heating system and heating controls within a property will have a large impact on the emissions expelled into the environment. Duchy homes will install boilers and cylinders that are energy efficient and will ensure suitable heating controls are also installed to help reduce a dwellings carbon footprint**.**

An ‘A’ rated combi or system boiler will be installed to each plot along with a cylinder with a low declared heat loss. A low declared loss results in a more efficient cylinder as it is better in the retention of heat so the boiler will not need to work as hard to get the hot water up to temperature.

Time and temperature zone controls divide the dwelling into two separate heating zones that are independently programmed (e.g. ground floor and first floor may be timed separately) according to occupation so that only the parts of the dwelling that

are used are heated. This helps to save on fuel bills and carbon emissions as certain areas of the house are not heated unnecessarily.

All dwellings on this site will be provided with the function to separately zone control the heating system. The requirement from building control is for dwellings under 150m^2, zone control is not a requirement, but it will be implemented by Duchy Homes to ensure each plot is as efficient as possible. Reducing the emissions produced and saving costs for the homeowner.

Renewables

Waste Water Heat Recovery (WWHR) extracts the heat from water which is wasted during a shower or bath. The extracted heat is then used to help heat fresh water from the main supply. This reduces the energy and carbon demand of the boiler that would typically occur when hot water is required.

All the dwellings on site are to be installed with a high performance WWHR system.

Photovoltaic Panels (PV) capture the sun's energy using Photovoltaic cells. The cells convert the sunlight into electricity that can be used to run household appliances and for lighting. PV cells do not need direct sunlight to work and so can still generate some electricity even on a cloudy day or were facing a more northerly elevation.

All the dwellings will be installed with PV Panels in the most southerly orientation to maximise their output.

Water Usage

Approved Document G - Sanitation, hot water safety and water efficiency of the Building Regulations sets a whole building standard for water use of 125litres per person per day.

With respect to water usage, within all of the plots on the proposed development, water efficient devices will be fully evaluated and installed to ensure that they will achieve water consumption levels of less than 125 litres per person per day.

The following devices will be considered for each home:

- Water saving taps
- Water saving cisterns
- Low pressure showers.
- Flow restrictors to manage water pressures to achieve optimum levels.
- Water meters to all premises with guidance on water consumption and savings.

Conclusion

The sustainability report produced on behalf of Duchy Homes for the site at Darton Lane, will explore, consider, and implement many factors to ensure that the site envelops high standards of sustainability.

The considerations that have been made are in relation to the:

- Building fabric improvements
- Passive solar
- Material sourcing and waste
- Fabric air tightness
- Low energy lighting
- Heating systems and controls
- Renewables
- Water usage